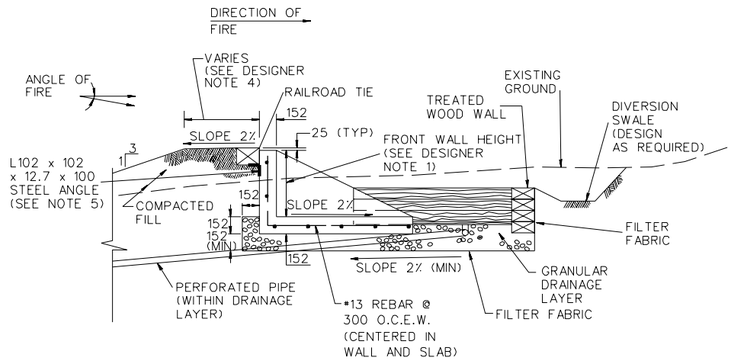
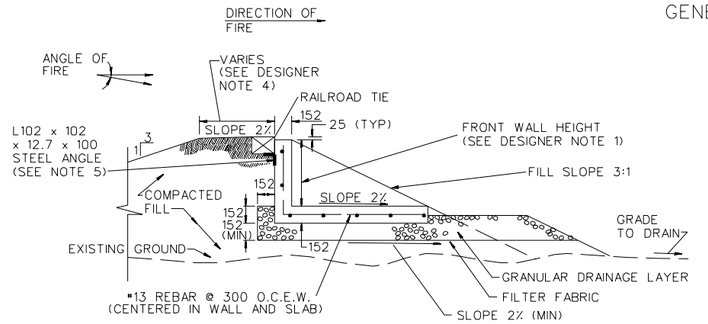


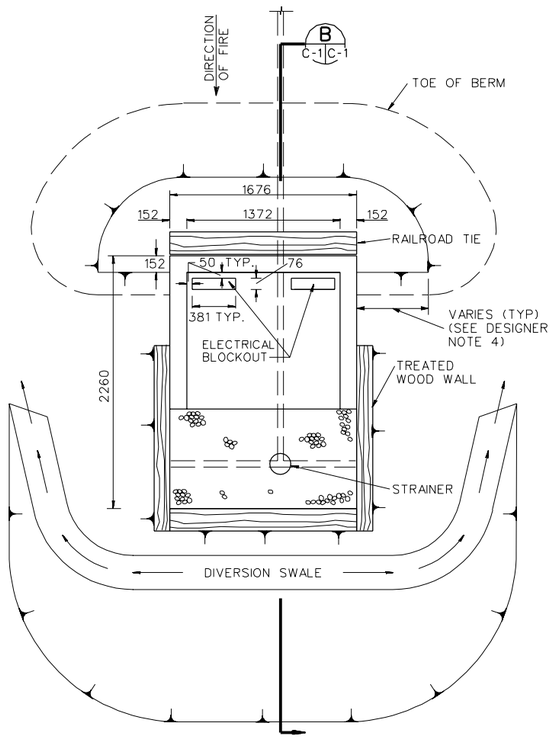
SECTION B
SCALE: N.T.S.



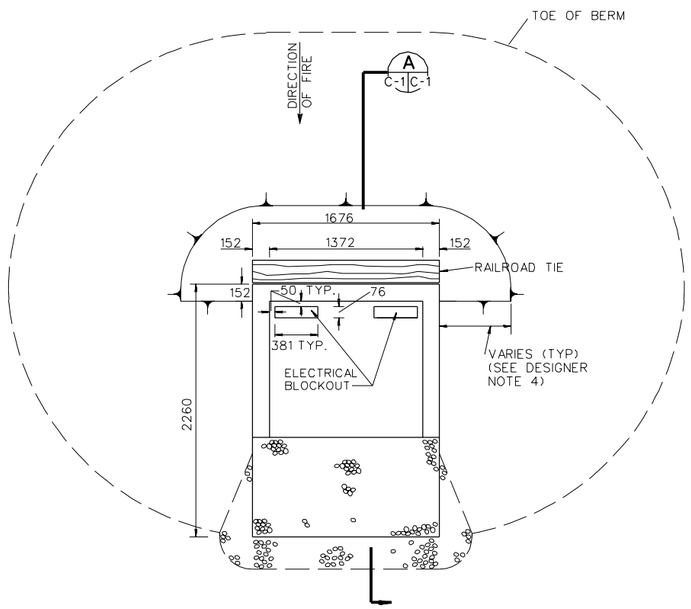
SECTION A
SCALE: N.T.S.

GENERAL NOTES:

1. CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 28 MPa IN 28 DAYS.
2. EMPLACEMENTS SHALL BE CONSTRUCTED OF REINFORCED CONCRETE; CONCRETE STRUCTURES SHALL BE PRECAST OR CAST-IN-PLACE.
3. ALL REINFORCING STEEL SHALL BE PER ASTM A615, GRADE 60.
4. AREAS DISTURBED BY CONSTRUCTION ACTIVITIES SHALL BE REVEGETATED OR RESURFACED CONSISTENT WITH THE NATURAL SURROUNDINGS. GROUND COVER SHALL NOT REDUCE TARGET VISIBILITY.
5. PLACE RAILROAD TIES AGAINST CONCRETE WALL ON L102x 102 x 12.7mm x 100mm STEEL ANGLES SPACED A MAXIMUM OF 900mm ON CENTER. ATTACH ANGLE TO CONCRETE WALL WITH CONCRETE ANCHORS.
6. ALL DIMENSIONS ARE mm UNLESS OTHERWISE INDICATED.



PLAN
ASCENDING SLOPE OR BELOW GRADE EMPLACEMENT
SCALE: N.T.S.



PLAN
SURFACE / FILL EMPLACEMENT
SCALE: N.T.S.

NOTES TO DESIGNER:

1. MINIMUM FRONT WALL HEIGHT IS 457 mm FOR ANGLES OF FIRE UP TO 20°. WALL HEIGHT WILL HAVE TO BE CALCULATED FOR ANGLES OF FIRE GREATER THAN 20°. IF THE TARGET MECHANISM IS TO BE ELEVATED, THE REQUIRED FRONT WALL HEIGHT SHOULD BE INCREASED BY THE DISTANCE BETWEEN THE BOTTOM OF THE MECHANISM AND THE TOP OF THE CONCRETE SLAB.
2. RETAINING WALLS SHALL BE CONSTRUCTED OF ADEQUATELY CONNECTED TIMBERS OR RAILROAD TIES (MAY BE PREFABRICATED). FILTER FABRIC SHALL BE INSTALLED BEHIND ALL WOOD RETAINING WALLS. FABRIC SHALL EXTEND THE FULL HEIGHT OF THE WALL.
3. THE DESIGNER SHOULD USE THE BELOW GRADE EMPLACEMENT DESIGN TO PROVIDE MORE REALISTIC TRAINING, IF THE SITE CONDITIONS ARE ADEQUATE TO SUPPORT POSITIVE DRAINAGE OF THE TARGET EMPLACEMENT. THE TOP OF THE SUBGRADE SHOULD HAVE A MINIMUM LONGITUDINAL SLOPE OF 2% TOWARD THE FRONT OF THE EMPLACEMENT.
4. REFER TO THE BERM THICKNESS FIGURES LOCATED IN THE DESIGN MANUAL TO DETERMINE THE REQUIRED BERM THICKNESS.
5. BERM SLOPES SHOWN AS 3:1 ARE TYPICAL. DIFFERENT SLOPES MAY BE REQUIRED BY SITE SPECIFIC GEOTECHNICAL REPORT.

STATIONARY INFANTRY TARGET EMPLACEMENT

US Army Corps of Engineers

Rev.	Description	Date	Approved
Rev. •			

Designed by: Date: Rev.
Dwn by: Ckd by: Design file no.
Reviewed by: Drawing code:
Submitted by: File name: Plot date: Plot scale:

U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
HUNTSVILLE, ALABAMA

RANGE AND TRAINING LAND PROGRAM
STANDARD DESIGN MANUAL

STATIONARY INFANTRY TARGET EMPLACEMENT

Sheet reference number: C-1
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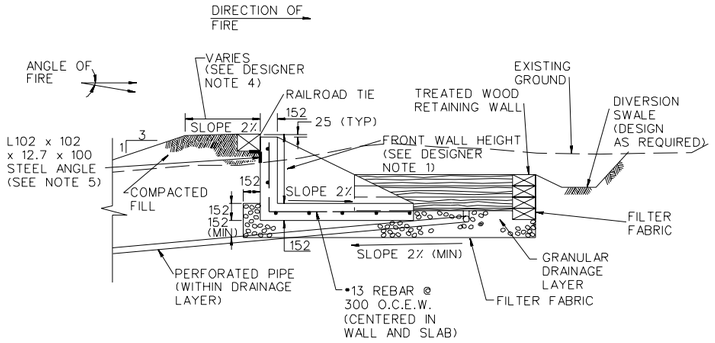
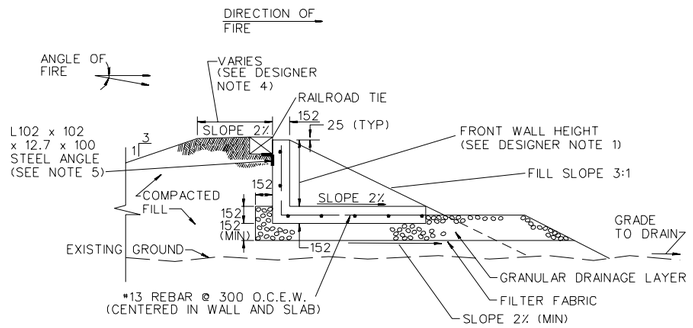


SECTION B C-2 C-2
SCALE: N.T.S.



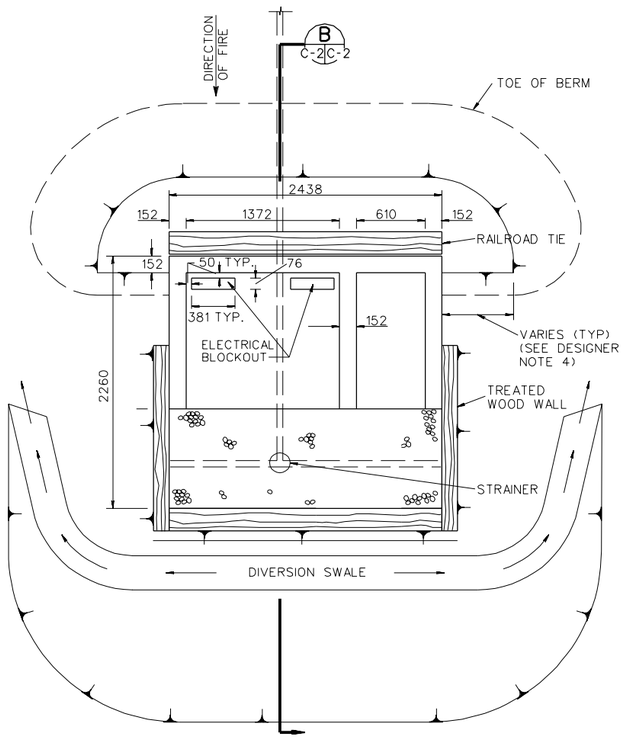
SECTION A C-2 C-2
SCALE: N.T.S.

GENERAL NOTES:

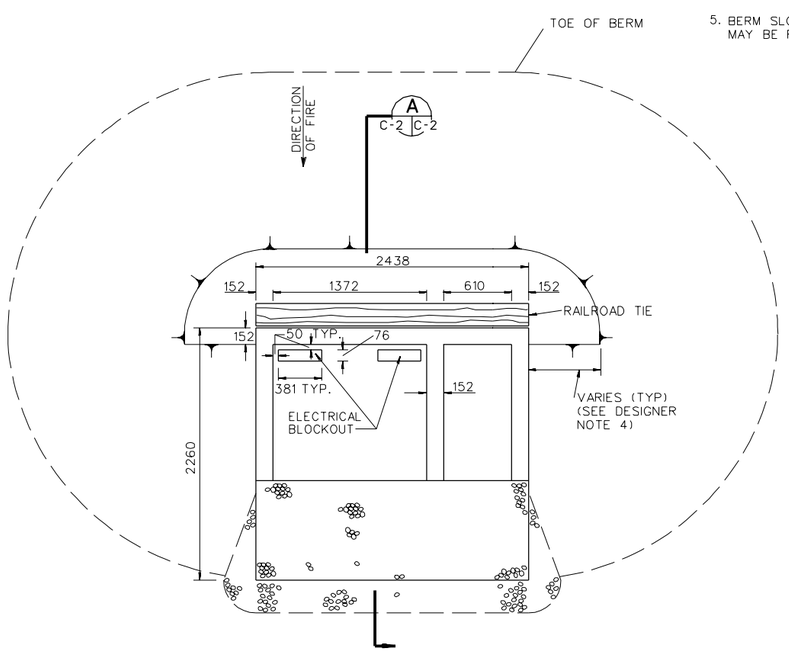
1. CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 28 MPa IN 28 DAYS.
2. EMPLACEMENTS SHALL BE CONSTRUCTED OF REINFORCED CONCRETE; CONCRETE STRUCTURES SHALL BE PRECAST OR CAST-IN-PLACE.
3. ALL REINFORCING STEEL SHALL BE PER ASTM A615, GRADE 60.
4. AREAS DISTURBED BY CONSTRUCTION ACTIVITIES SHALL BE REVEGETATED OR RESURFACED CONSISTENT WITH THE NATURAL SURROUNDINGS. GROUND COVER SHALL NOT REDUCE TARGET VISIBILITY.
5. PLACE RAILROAD TIES AGAINST CONCRETE WALL ON L102x 102 x 12.7mm x 100mm STEEL ANGLES SPACED A MAXIMUM OF 900mm ON CENTER. ATTACH ANGLE TO CONCRETE WALL WITH CONCRETE ANCHORS.
6. ALL DIMENSIONS ARE mm UNLESS OTHERWISE INDICATED.

NOTES TO DESIGNER:

1. MINIMUM FRONT WALL HEIGHT IS 457 mm FOR ANGLES OF FIRE UP TO 20°. WALL HEIGHT WILL HAVE TO BE CALCULATED FOR ANGLES OF FIRE GREATER THAN 20°. IF THE TARGET MECHANISM IS TO BE ELEVATED, THE REQUIRED FRONT WALL HEIGHT SHOULD BE INCREASED BY THE DISTANCE BETWEEN THE BOTTOM OF THE MECHANISM AND THE TOP OF THE CONCRETE SLAB.
2. RETAINING WALLS SHALL BE CONSTRUCTED OF ADEQUATELY CONNECTED TIMBERS OR RAILROAD TIES (MAY BE PREFABRICATED). FILTER FABRIC SHALL BE INSTALLED BEHIND ALL WOOD RETAINING WALLS. FABRIC SHALL EXTEND THE FULL HEIGHT OF THE WALL.
3. THE DESIGNER SHOULD USE THE BELOW GRADE EMPLACEMENT DESIGN TO PROVIDE MORE REALISTIC TRAINING, IF THE SITE CONDITIONS ARE ADEQUATE TO SUPPORT POSITIVE DRAINAGE OF THE TARGET EMPLACEMENT, THE TOP OF THE SUBGRADE SHOULD HAVE A MINIMUM LONGITUDINAL SLOPE OF 2% TOWARD THE FRONT OF THE EMPLACEMENT.
4. REFER TO THE BERM THICKNESS FIGURES LOCATED IN THE DESIGN MANUAL TO DETERMINE THE REQUIRED BERM THICKNESS.
5. BERM SLOPES SHOWN AS 3:1 ARE TYPICAL. DIFFERENT SLOPES MAY BE REQUIRED BY SITE SPECIFIC GEOTECHNICAL REPORT.



PLAN
ASCENDING SLOPE OR BELOW GRADE EMPLACEMENT
SCALE: N.T.S.



PLAN
SURFACE / FILL EMPLACEMENT
SCALE: N.T.S.

STATIONARY INFANTRY TARGET EMPLACEMENT WITH HOSTILE FIRE SIMULATOR

US Army Corps of Engineers

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Dwn by: | Ckd by: | Design file no.
Reviewed by: | Submitted by: | Drawing code:
File name:
Plot date:
Plot scale:

U. S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
HUNTSVILLE, ALABAMA

RANGE AND TRAINING LAND PROGRAM
STANDARD DESIGN MANUAL

STATIONARY INFANTRY TARGET/INFANTRY HOSTILE FIRE SIMULATOR EMPLACEMENT

Sheet reference number:
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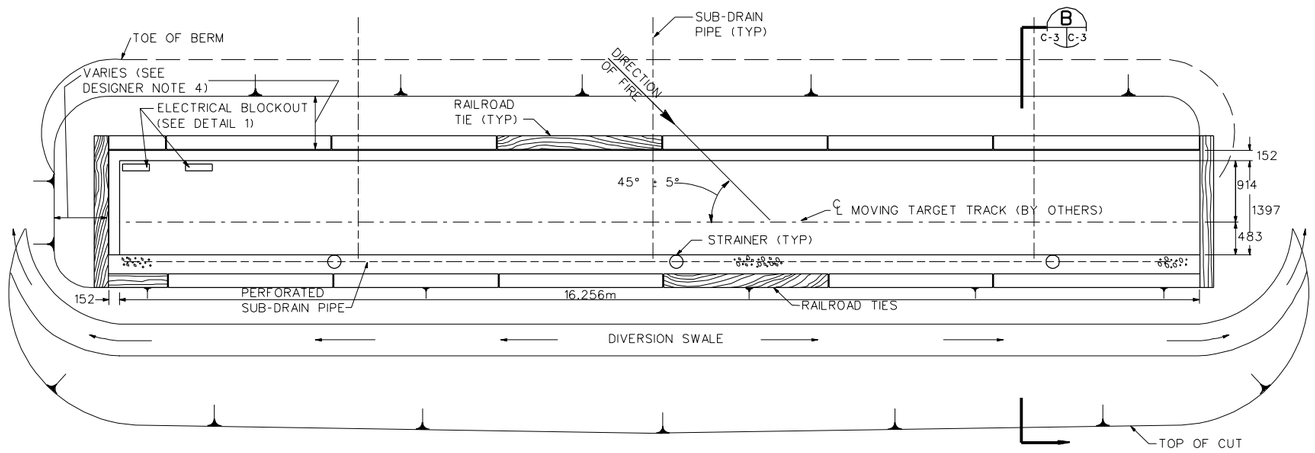
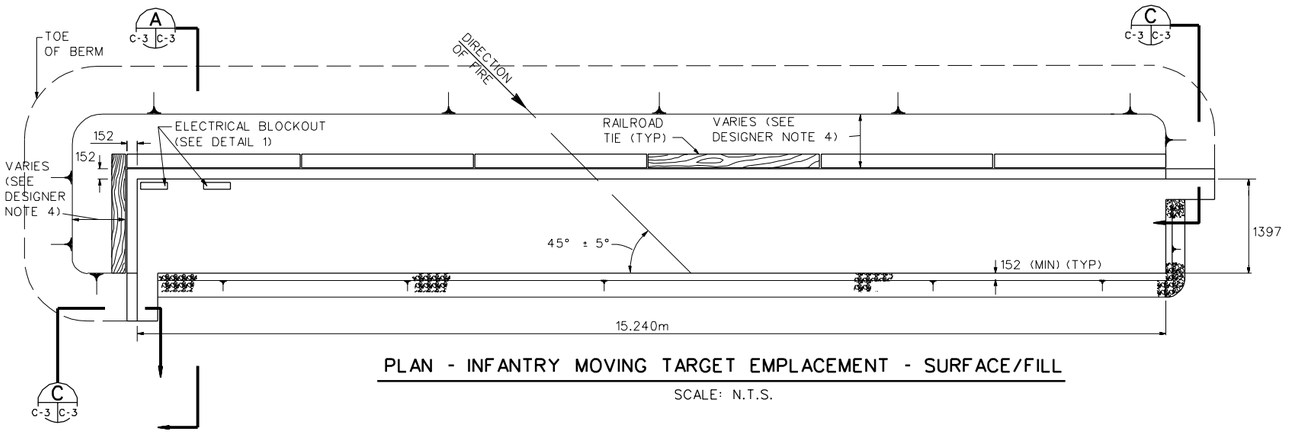


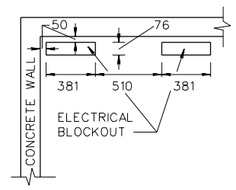
PLAN - INFANTRY MOVING TARGET EMPLACEMENT - ASCENDING SLOPE OR BELOW GRADE

SCALE: N.T.S.



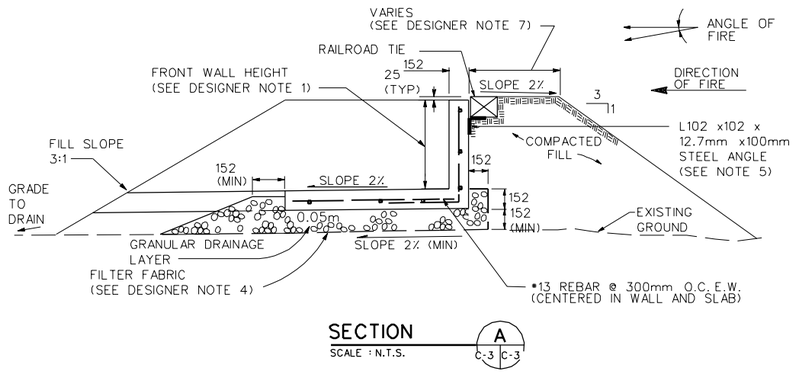
PLAN - INFANTRY MOVING TARGET EMPLACEMENT - SURFACE/FILL

SCALE: N.T.S.



DETAIL 1 ELECTRICAL BLOCKOUT DETAIL

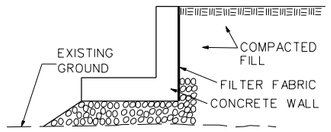
SCALE: N.T.S.



SECTION A

SCALE : N.T.S.

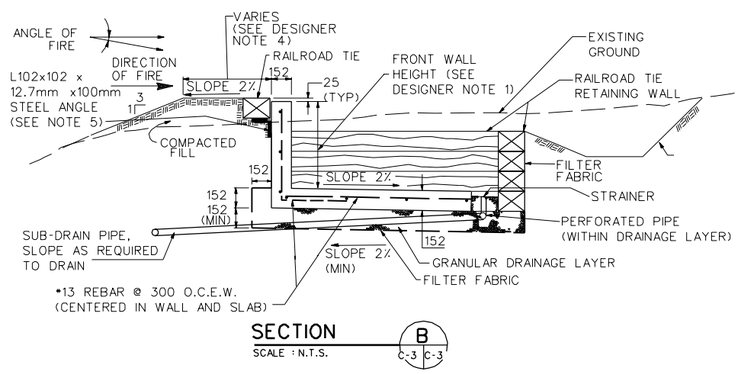
C-3 C-3



SECTION C

SCALE : N.T.S.

C-3 C-3



SECTION B

SCALE : N.T.S.

C-3 C-3

GENERAL NOTES:

1. CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 28 MPa IN 28 DAYS.
2. EMPLACEMENTS SHALL BE CONSTRUCTED OF REINFORCED CONCRETE; CONCRETE STRUCTURES SHALL BE PRECAST OR CAST-IN-PLACE.
3. ALL REINFORCING STEEL SHALL BE PER ASTM A615, GRADE 60.
4. AREAS DISTURBED BY CONSTRUCTION ACTIVITIES SHALL BE REVEGETATED OR RESURFACED CONSISTENT WITH THE NATURAL SURROUNDINGS. GROUND COVER SHALL NOT REDUCE TARGET VISIBILITY.
5. PLACE RAILROAD TIES AGAINST CONCRETE WALL ON L102 x 102 x 12.7mm x 100mm STEEL ANGLES SPACED A MAXIMUM OF 900mm ON CENTER. ATTACH ANGLE TO CONCRETE WALL WITH CONCRETE ANCHORS.
6. ALL DIMENSIONS ARE mm UNLESS OTHERWISE INDICATED.
7. THE EMPLACEMENT MAY BE REVERSED OR MIRRORED FROM WHAT IS SHOWN HERE. IN ANY CASE, THE PROTECTED END OF THE EMPLACEMENT IS ALWAYS NEARER TO THE FIRING POINT AND THE ELECTRIAL BLOCKOUT IS ON THE PROTECTED END.

NOTES TO DESIGNER:

1. MINIMUM FRONT WALL HEIGHT IS 660mm FOR ANGLES OF FIRE UP TO 11°. WALL HEIGHT WILL HAVE TO BE CALCULATED FOR ANGLES OF FIRE GREATER THAN 11°. IF THE TRACK IS TO BE ELEVATED, THE REQUIRED FRONT WALL HEIGHT SHOULD BE INCREASED BY THE DISTANCE BETWEEN THE BOTTOM OF THE TIE AND THE TOP OF THE CONCRETE SLAB.
2. FOR LOCATIONS REQUIRING DIRECTION OF FIRE OF 45° ±5° FROM RIGHT OF TRACK CENTERLINE, PLANS AND SECTIONS SHOULD BE ANNOTATED FOR CONSTRUCTION IN A MIRROR IMAGE CONFIGURATION TO THAT SHOWN, WITH THE CJB BEING PLACED AT THE END OF THE EMPLACEMENT NEAREST TO THE FIRING POSITION.
3. THE DESIGNER SHOULD USE THE BELOW GRADE EMPLACEMENT DESIGN TO PROVIDE MORE REALISTIC TRAINING, IF THE SITE CONDITIONS ARE ADEQUATE TO SUPPORT POSITIVE DRAINAGE OF THE TARGET EMPLACEMENT, THE TOP OF THE SUBGRADE SHOULD HAVE A MINIMUM LONGITUDINAL SLOPE OF 2% TOWARD THE FRONT OF THE EMPLACEMENT.
4. REFER TO THE BERM THICKNESS FIGURES LOCATED IN THE DESIGN MANUAL TO DETERMINE THE REQUIRED BERM THICKNESS.
5. BERM SLOPES SHOWN AS 3:1 ARE TYPICAL. DIFFERENT SLOPES MAY BE REQUIRED BY SITE SPECIFIC GEOTECHNICAL REPORT.
6. RETAINING WALLS SHALL BE CONSTRUCTED OF ADEQUATELY CONNECTED TIMBERS OR RAILROAD TIES (MAY BE PREFABRICATED). FILTER FABRIC SHALL BE INSTALLED BEHIND ALL WOOD RETAINING WALLS. FABRIC SHALL EXTEND THE FULL HEIGHT OF THE WALL.

US Army Corps of Engineers

Rev.	Description	Date	Approved
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Reviewed by: | File name: Plot date: Plot scale:
Submitted by:

U. S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE HUNTSVILLE, ALABAMA

RANGE AND TRAINING LAND PROGRAM
STANDARD DESIGN MANUAL

MOVING INFANTRY TARGET EMPLACEMENT

Sheet reference number: C-3

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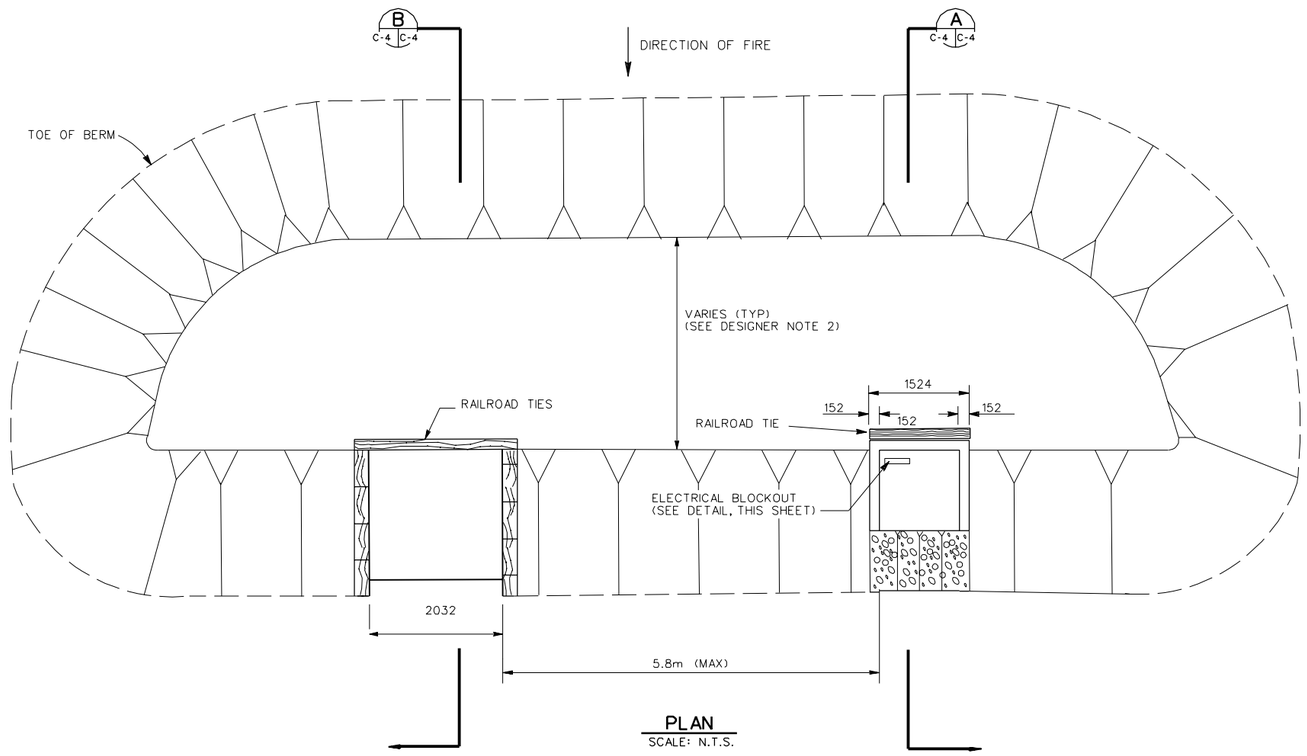


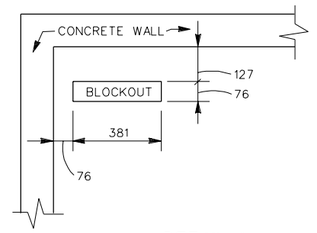
PLAN
SCALE: N.T.S.

GENERAL NOTES:

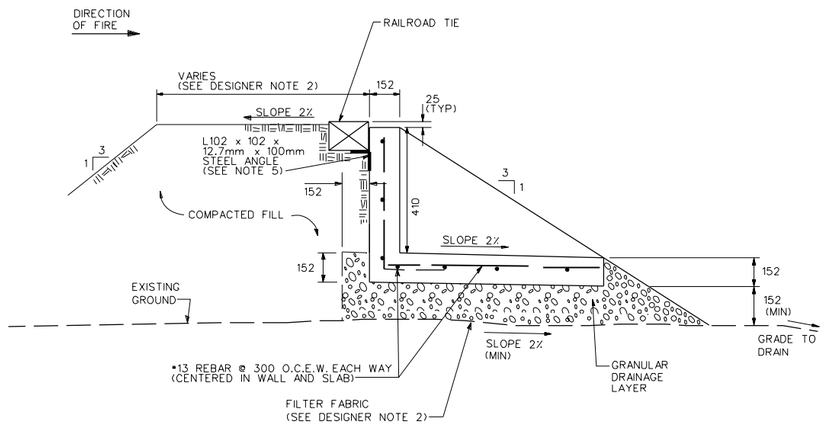
1. CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 28 MPa IN 28 DAYS.
2. SMALLER EMPLACEMENT (SECTION A) SHALL BE CONSTRUCTED OF REINFORCED CONCRETE; CONCRETE STRUCTURE SHALL BE PRECAST OR CAST-IN-PLACE.
3. ALL REINFORCING STEEL SHALL BE PER ASTM A615, GRADE 60.
4. AREAS DISTURBED BY CONSTRUCTION ACTIVITIES SHALL BE REVEGETATED OR RESURFACED CONSISTENT WITH THE NATURAL SURROUNDINGS. GROUND COVER SHALL NOT REDUCE EMPLACEMENT VISIBILITY.
5. PLACE RAILROAD TIES AGAINST CONCRETE WALL ON L102 x 102 x 12.7mm x 100mm STEEL ANGLES SPACED A MAXIMUM OF 900mm ON CENTER. ATTACH ANGLE TO CONCRETE WALL WITH CONCRETE ANCHORS.
6. ALL DIMENSIONS ARE mm UNLESS OTHERWISE INDICATED

NOTES TO DESIGNER:

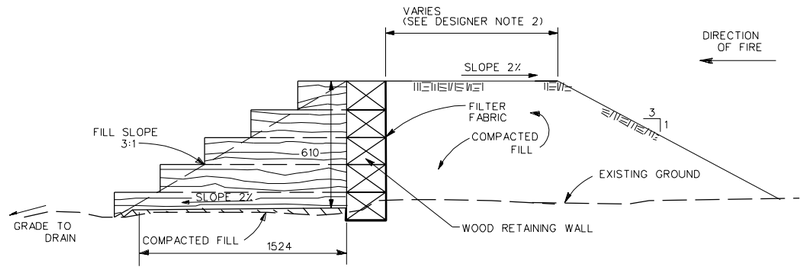
1. RETAINING WALLS SHALL BE CONSTRUCTED OF ADEQUATELY CONNECTED TIMBERS OR RAILROAD TIES (MAY BE PREFABRICATED). FILTER FABRIC SHALL BE INSTALLED BEHIND ALL WOOD RETAINING WALLS. FABRIC SHALL EXTEND THE FULL HEIGHT OF THE WALL.
2. REFER TO THE BERM THICKNESS FIGURES LOCATED IN THE DESIGN MANUAL TO DETERMINE THE REQUIRED BERM THICKNESS.



DETAIL 1
ELECTRICAL BLOCKOUT DETAIL
SCALE: N.T.S.



SECTION A
SCALE : N.T.S.



SECTION B
SCALE : N.T.S.

US Army Corps of Engineers

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Submitted by: | File name: / Proj. name: / Proj. code:

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HUNTSVILLE, ALABAMA

RANGE AND TRAINING LAND PROGRAM
STANDARD DESIGN MANUAL

MORTAR SIMULATION DEVICE EMPLACEMENT

Sheet reference number: C-4

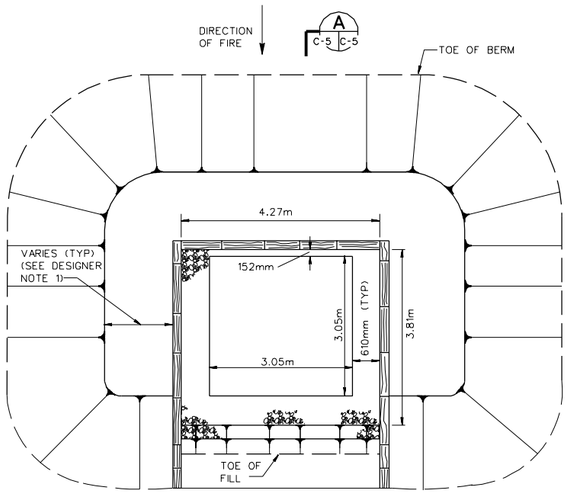
Sheet of

NOTES TO DESIGNER:

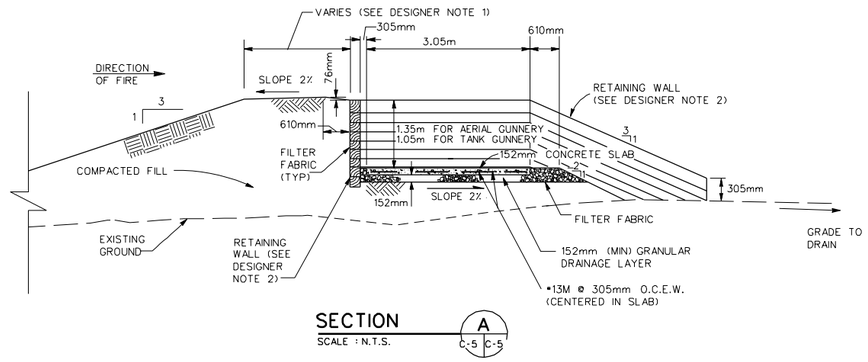
1. REFER TO THE BERM THICKNESS FIGURES LOCATED IN THE DESIGN MANUAL TO DETERMINE THE REQUIRED BERM THICKNESS.
2. ALL RETAINING WALLS MUST BE DESIGNED USING SITE SPECIFIC GEOTECHNICAL DESIGN PARAMETERS OBTAINED FROM A SUBSURFACE INVESTIGATION. RETAINING WALLS MAY BE CONSTRUCTED OF TREATED TIMBERS, RAILROAD TIES, CAST-IN-PLACE CONCRETE OR PRECAST CONCRETE. THE WALL SHALL BE DESIGNED SUCH THAT THE TOP 300mm (MIN) OF THE WALL CAN BE REMOVED AND REPLACED IN SECTIONS.
3. BERM SLOPES SHOWN AS 3:1. SLOPES MAY VARY AS REQUIRED BY SITE SPECIFIC GEOTECHNICAL REPORT.

GENERAL NOTES:

1. CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 28 MPa IN 28 DAYS.
2. ALL REINFORCING STEEL SHALL BE PER ASTM A615, GRADE 60.
3. IF RETAINING WALLS ARE CONSTRUCTED OF TREATED TIMBERS, RAILROAD TIES, OR CONCRETE MEMBERS FILTER FABRIC SHALL BE INSTALLED BEHIND THE WALLS. FABRIC SHALL EXTEND THE FULL HEIGHT OF THE WALL.
4. AREAS DISTURBED BY CONSTRUCTION ACTIVITIES SHALL BE REVEGETATED OR RESURFACED CONSISTENT WITH THE NATURAL SURROUNDINGS. GROUND COVER SHALL NOT REDUCE TARGET VISIBILITY.



PLAN VIEW
SCALE: N.T.S.



SECTION A
SCALE : N.T.S.
C-5 C-5

STATIONARY ARMOR TARGET EMPLACEMENT

SCALE: N.T.S.

US Army Corps of Engineers

Rev.	Description	Date	Approved
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Submitted by:
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U. S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
HUNTSVILLE, ALABAMA

RANGE AND TRAINING LAND PROGRAM
STANDARD DESIGN MANUAL

STATIONARY ARMOR TARGET EMPLACEMENT

Sheet reference number:
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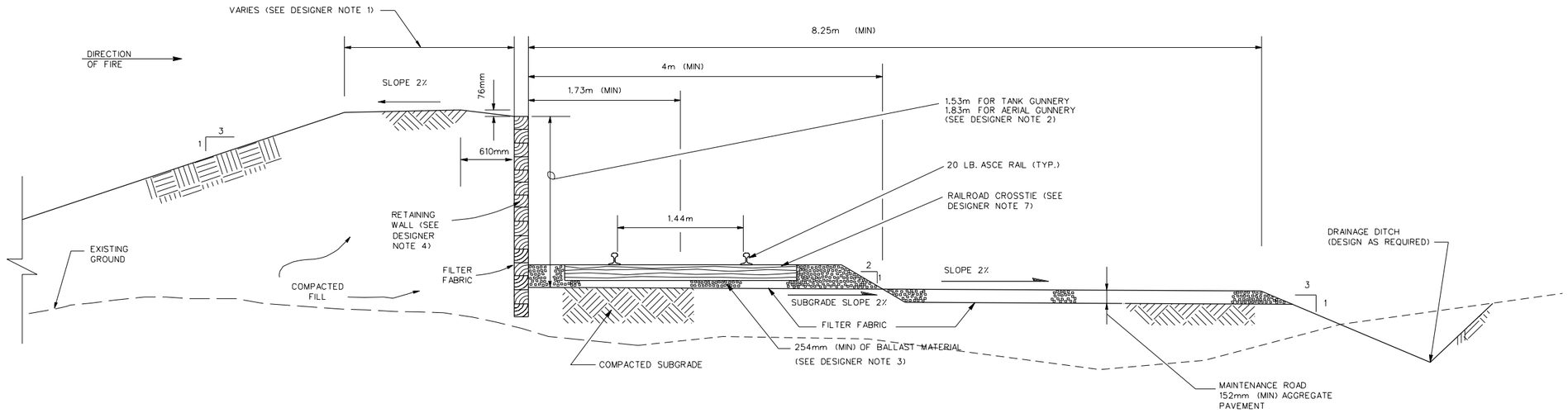


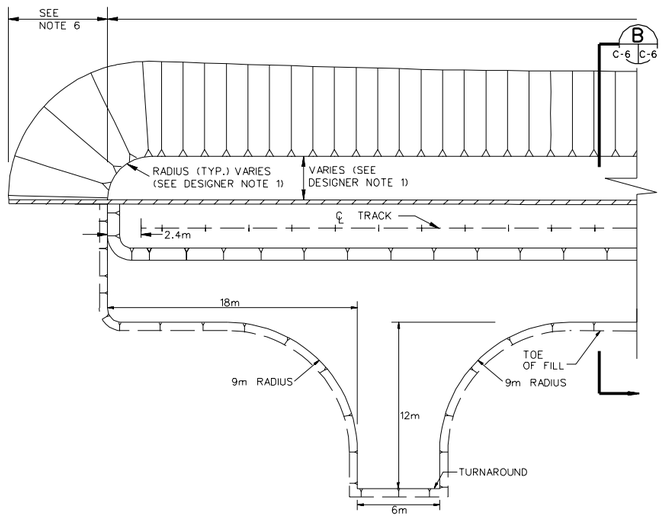
SECTION B C-6 C-6
SCALE : N.T.S.

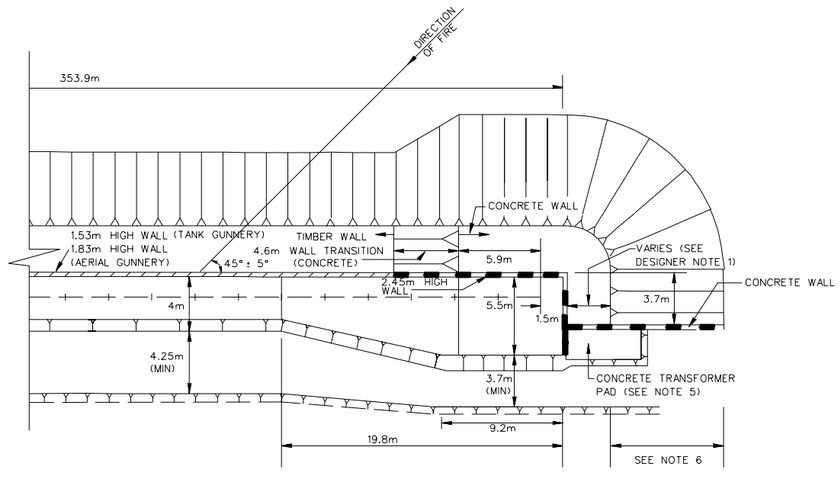
NOTES TO DESIGNER:

1. REFER TO THE BERM THICKNESS FIGURES LOCATED IN THE DESIGN MANUAL TO DETERMINE THE REQUIRED BERM THICKNESS.
2. THE HEIGHT OF THE MAT BERM IS MEASURED FROM THE TOP OF SUBGRADE THIS DIMENSION MUST BE MAINTAINED.
3. BALLAST SHALL CONFORM TO AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION (AREMA) REQUIREMENTS FOR #57 BALLAST.
4. ALL RETAINING WALLS MUST BE DESIGNED USING SITE SPECIFIC GEOTECHNICAL DESIGN PARAMETERS OBTAINED FROM A SUBSURFACE INVESTIGATION. RETAINING WALLS MAY BE CONSTRUCTED OF TREATED TIMBERS, RAILROAD TIES, CAST-IN-PLACE CONCRETE OR PRECAST CONCRETE. THE WALL SHALL BE DESIGNED SUCH THAT THE TOP 300mm (MIN) OF THE WALL CAN BE REMOVED AND REPLACED IN SECTIONS.
5. MOVING ARMOR TARGET EMPLACEMENT MAY BE CONSTRUCTED IN A MIRROR IMAGE CONFIGURATION TO THAT SHOWN.
6. BERM SLOPES SHOWN AS 3:1. SLOPES MAY VARY AS REQUIRED BY SITE SPECIFIC GEOTECHNICAL REPORT.
7. RAILROAD CROSSTIES SHALL BE SPACED AT 1.52m ON CENTER. CROSSTIES SHALL BE PLACED LEVEL.

GENERAL NOTES:

1. CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 28 MPa IN 28 DAYS.
2. ALL REINFORCING STEEL SHALL BE PER ASTM A615, GRADE 60.
3. IF RETAINING WALLS ARE CONSTRUCTED OF TREATED TIMBERS OR RAILROAD TIES, FILTER FABRIC SHALL BE INSTALLED BEHIND THE WALLS. FABRIC SHALL EXTEND THE FULL HEIGHT OF THE WALL.
4. AREAS DISTURBED BY CONSTRUCTION ACTIVITIES SHALL BE REVEGETATED OR RESURFACED CONSISTENT WITH THE NATURAL SURROUNDINGS. GROUND COVER SHALL NOT REDUCE TARGET VISIBILITY.
5. ELECTRICAL TRANSFORMER PAD SIZE SHALL BE OBTAINED FROM ELECTRICAL CONTRACTOR.
6. SLOPE WALL AT A 3:1 SLOPE TO A POINT 300mm ABOVE THE EXISTING GRADE.





MOVING ARMOR TARGET EMPLACEMENT
SCALE: N.T.S.

US Army Corps of Engineers

Rev.	Description	Date	Approved
Rev. *			

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Reviewed by: | Drawing code:
Submitted by: | File name: / Plot date: / Plot scale:

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HUNTSVILLE, ALABAMA

RANGE AND TRAINING LAND PROGRAM
STANDARD DESIGN MANUAL
MOVING ARMOR TARGET EMPLACEMENT

Sheet reference number: C-6
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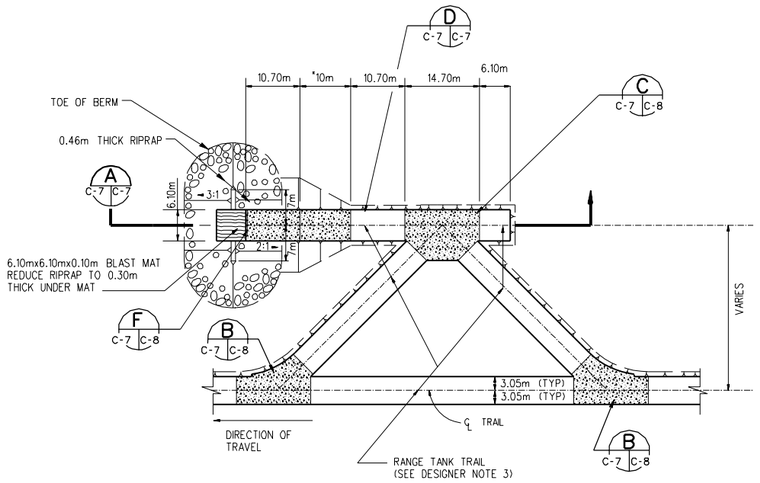

DEFILADE

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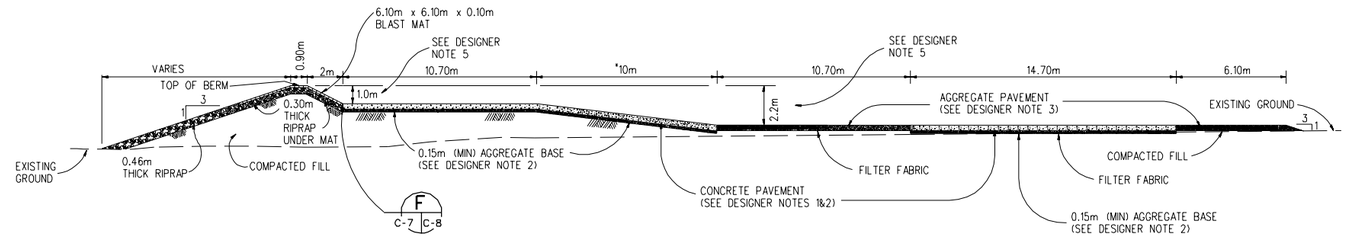

SECTION

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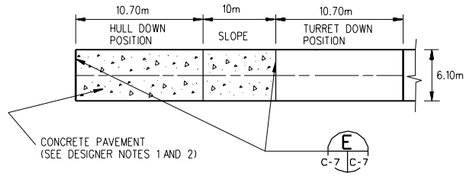
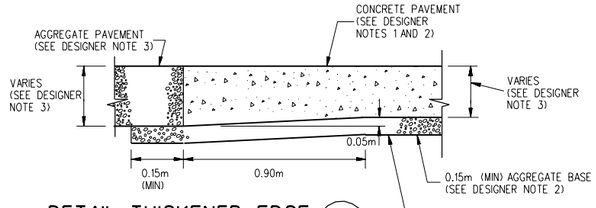
A C-7 C-7



DETAIL TANK PAD

SCALE : N.T.S.

D C-7 C-7



DETAIL THICKENED EDGE

SCALE : N.T.S.

E C-7 C-8 C-7

SEE SHEET C-8 FOR NOTES

* THE DEFILADE SHOWN IS A TWO TIER DEFILADE TO ACCOMMODATE HULL DOWN AND TURRET DOWN POSITIONS. TO CONVERT FROM THE TWO TIER TO THE MORE COMMON HULL DOWN DEFILADE, FLATTEN THE INDICATED 10m SECTION TO LEVEL AND CHANGE IT FROM CONCRETE TO AGGREGATE PAVEMENT.

US Army Corps of Engineers

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Submitted by: File name: Plot date: Plot scale:

U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
HUNTSVILLE, ALABAMA

RANGE AND TRAINING LAND PROGRAM
STANDARD DESIGN MANUAL

DEFILADE (1 of 2)

Sheet reference number: C-7

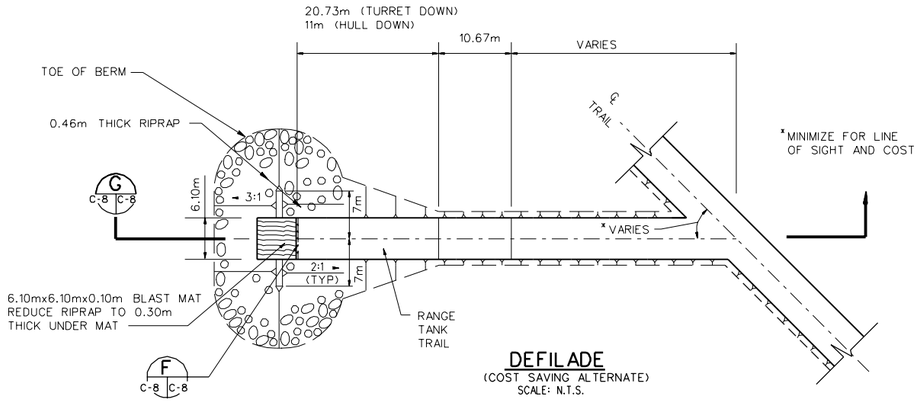
Sheet of

GENERAL NOTES:

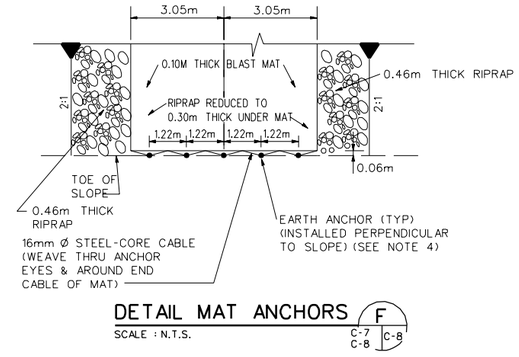
1. CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 28 MPa IN 28 DAYS.
2. ALL REINFORCING STEEL SHALL BE PER ASTM A615, GRADE 60.
3. AREAS DISTURBED BY CONSTRUCTION ACTIVITIES SHALL BE REVEGETATED OR RESURFACED CONSISTENT WITH THE NATURAL SURROUNDINGS.
4. EARTH ANCHOR TO BE 19mmØ X 1.22m STEEL ROD WITH SOLID EYE AND 0.15m HELIX BRACED BY LATERAL STABILIZER PLATE.

NOTES TO DESIGNER:

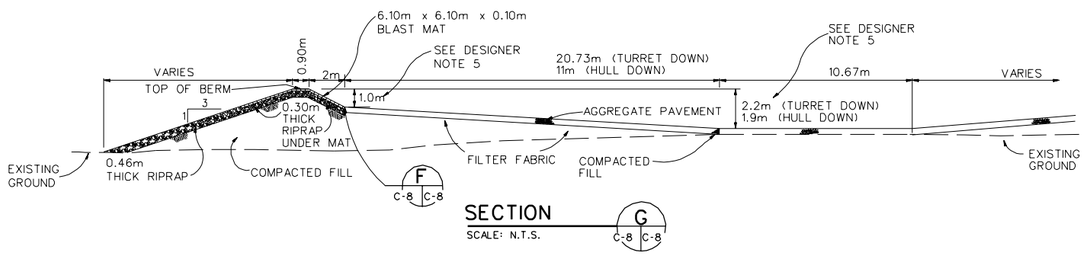
1. SEE TM 5-822-5 FOR SPACING REQUIREMENTS AND DETAILS FOR CONSTRUCTION & CONTRACTION JOINTS.
2. SEE TM 5-822-2 AND TM 5-822-5 FOR DESIGN OF RIGID PAVEMENT.
3. REFER TO THE UNSURFACED THICKNESS DESIGN CURVES FOR TANK TRAILS IN THE DESIGN MANUAL FOR AGGREGATE PAVEMENT DESIGN.
4. FOR DEFILADE LOCATED ON LEFT SIDE OF TRAIL, PLAN SHOULD BE ANNOTATED FOR CONSTRUCTION IN A MIRROR IMAGE CONFIGURATION TO THAT SHOWN.
5. HULL DOWN AND TURRET DOWN HEIGHT SHALL BE COORDINATED WITH THE TRAINER. (HEIGHT MUST BE BELOW THAT OF THE TANK COMMANDER'S SIGHT.)



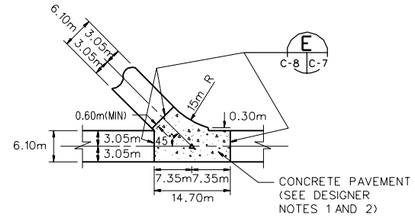
DEFILADE
(COST SAVING ALTERNATE)
SCALE: N.T.S.



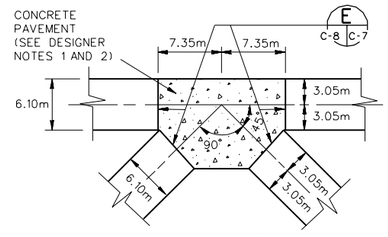
DETAIL MAT ANCHORS
SCALE : N.T.S.
F C-7 C-8 C-8



SECTION
SCALE: N.T.S.
G C-8 C-8



DETAIL TANK TRAIL TURNOUT
SCALE : N.T.S.
B C-7 C-8



DETAIL TURNPAD
SCALE : N.T.S.
C C-7 C-8

US Army Corps of Engineers

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RANGE AND TRAINING LAND PROGRAM
STANDARD DESIGN MANUAL

DEFILADE (2 OF 2)

Sheet reference number:
C-8
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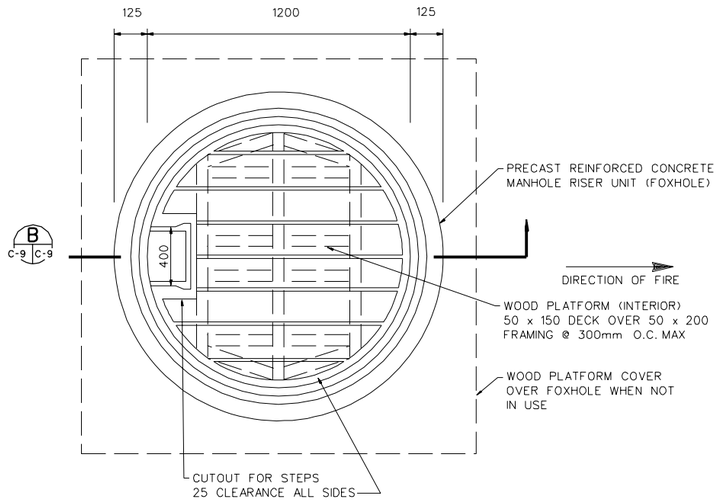
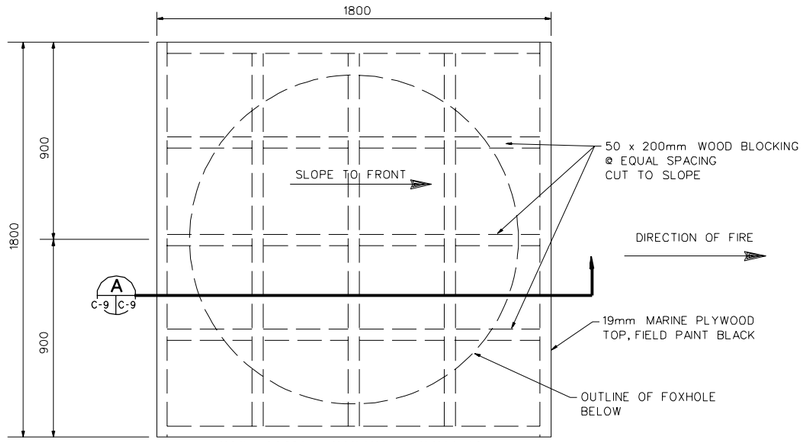
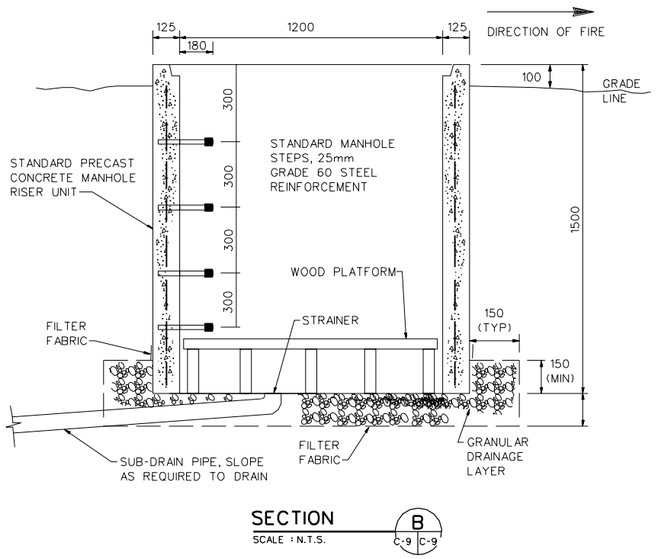


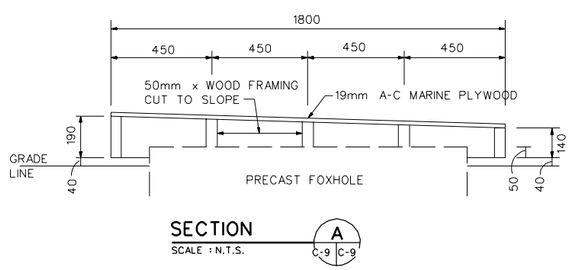
ONE MAN FOXHOLE PLAN
SCALE: N.T.S.



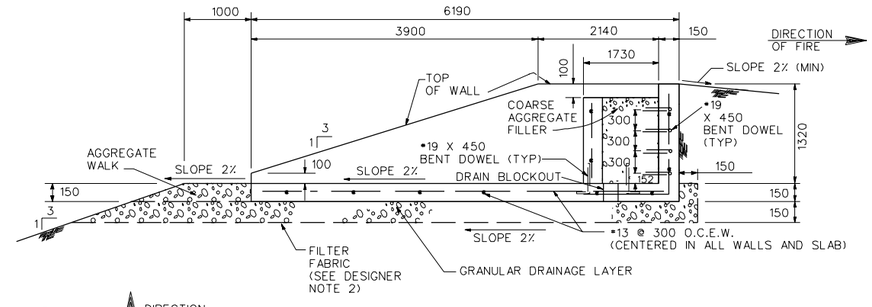
ONE MAN FOXHOLE COVER
SCALE: N.T.S.

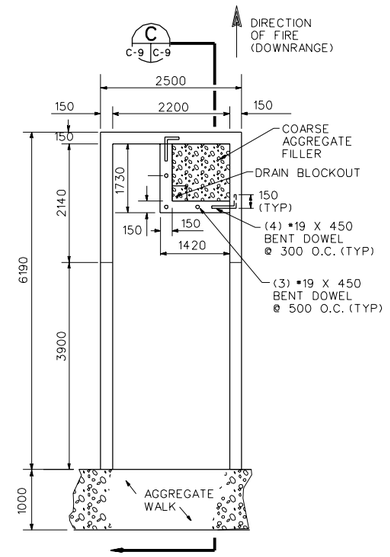


SECTION B
SCALE : N.T.S. C-9 C-9



SECTION A
SCALE : N.T.S. C-9 C-9





WALK-IN FOXHOLE PLAN
SCALE: N.T.S.

SECTION C
SCALE : N.T.S. C-9 C-9

GENERAL NOTES:

1. CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 28 MPa IN 28 DAYS.
2. FOXHOLES SHALL BE CONSTRUCTED OF REINFORCED CONCRETE; CONCRETE STRUCTURES SHALL BE PRE-CAST OR CAST-IN-PLACE.
3. ALL REINFORCING STEEL SHALL BE PER ASTM A615, GRADE 60.
4. AREAS DISTURBED BY CONSTRUCTION ACTIVITIES SHALL BE REVEGETATED OR RESURFACED CONSISTENT WITH THE NATURAL SURROUNDINGS. GROUND COVER SHALL NOT REDUCE TARGET VISIBILITY.
5. ALL WOOD FRAMING SHALL BE PRESSURE TREATED. ALL WOOD CONNECTIONS SHALL BE MADE WITH HOT-DIPPED GALVANIZED NAILS.
6. ALL DIMENSIONS ARE mm UNLESS OTHERWISE INDICATED

NOTES TO DESIGNER:

1. THE USING AGENCY MAY REQUIRE A SURFACE FOR A PRONE FIRING POSITION NEAR THE FOXHOLE. THE DESIGNER SHALL COORDINATE THE MATERIAL AND LOCATION WITH THE USING AGENCY.
2. THE NEED FOR FILTER FABRIC SHOULD BE EVALUATED AS PART OF THE SITE ADAPTION PROCESS. A FILTER LAYER MAY OR MAY NOT BE REQUIRED DEPENDING UPON THE SOIL TYPE AT A PARTICULAR SITE.

US Army Corps of Engineers

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Rev. •			

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Submitted by:

U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE HUNTSVILLE, ALABAMA

RANGE AND TRAINING LAND PROGRAM
STANDARD DESIGN MANUAL

ONE-MAN AND WALK-IN FOXHOLES

Sheet reference number: C-9

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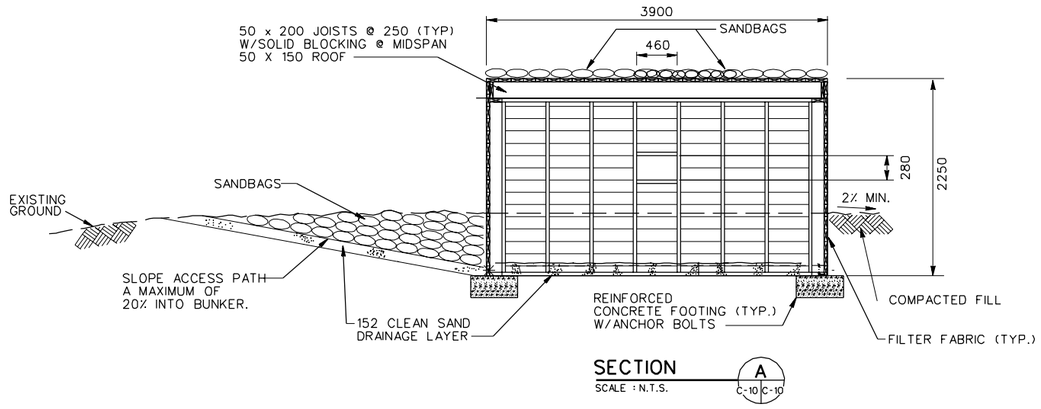


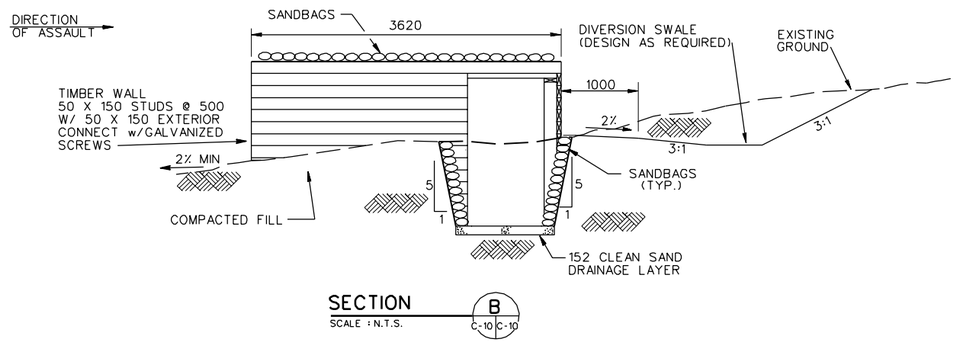
SECTION A
SCALE : N.T.S.
C-10 C-10

GENERAL NOTES:

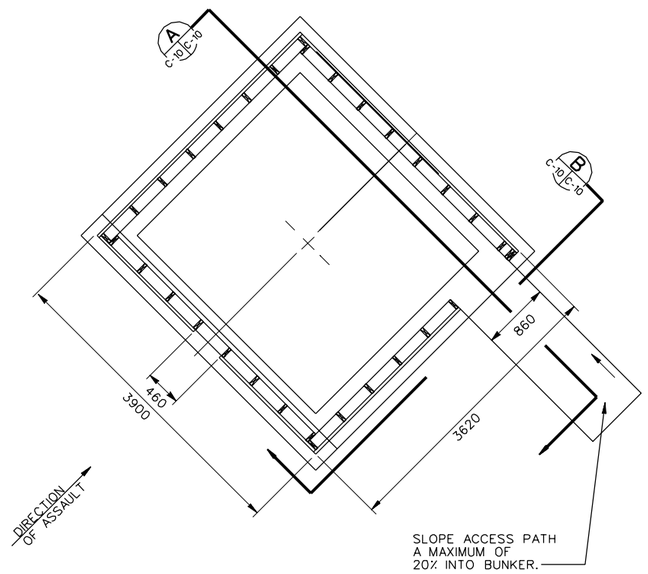
1. WALLS AND ROOF SHALL BE CONSTRUCTED OF TREATED TIMBERS. FILTER FABRIC SHALL BE INSTALLED ABOVE ROOF AND BEHIND ALL WOOD WALLS BELOW GRADE.
2. AREAS DISTURBED BY CONSTRUCTION ACTIVITIES SHALL BE REVEGETATED OR RESURFACED CONSISTENT WITH THE NATURAL SURROUNDINGS. GROUND COVER SHALL NOT REDUCE BUNKER VISIBILITY.
3. ALL DIMENSIONS ARE mm UNLESS OTHERWISE INDICATED
4. CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 28 MPa IN 28 DAYS.

NOTES TO DESIGNER:

1. PROVIDE A SUBDRAIN SYSTEM TO ENSURE ADEQUATE DRAINAGE OF BUNKER.
2. THE NEED FOR FILTER FABRIC SHOULD BE EVALUATED AS PART OF THE SITE ADAPTION PROCESS. A FILTER LAYER MAY OR MAY NOT BE REQUIRED DEPENDING UPON THE SOIL TYPE AT A PARTICULAR SITE.
3. THIS GENERIC DESIGN FOR THE BUNKER MUST BE SITE ADAPTED TO SPECIFIC SITE CONDITIONS DETERMINED BY A SUBSURFACE INVESTIGATION AND A TOPOGRAPHIC SURVEY.
4. SANDBAGS SHOULD BE MADE OF A MILDEW RESISTANT MATERIAL.
5. DEPTH OF FOOTING WILL VARY DEPENDING UPON SUBSURFACEINVESTIGATION AND COMPACTION REQUIREMENTS DURING CONSTRUCTION.
6. DESIGNER MUST VERIFY STRUCTURAL DESIGN BASED ON LOCAL CONDITIONS



SECTION B
SCALE : N.T.S.
C-10 C-10



PLAN-OBSERVATION BUNKER
SCALE: N.T.S.

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RANGE AND TRAINING LAND PROGRAM
STANDARD DESIGN MANUAL

MACHINE GUN/OBSERVATION BUNKER

Sheet reference number:
C-10
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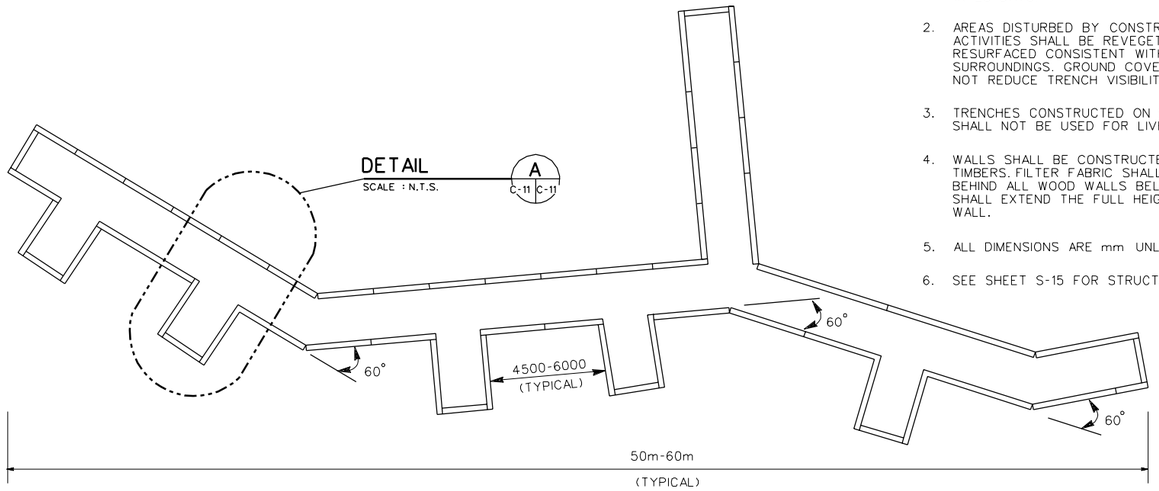
GENERAL NOTES:

1. CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 28 MPa IN 28 DAYS.
2. AREAS DISTURBED BY CONSTRUCTION ACTIVITIES SHALL BE REVEGETATED OR RESURFACED CONSISTENT WITH THE NATURAL SURROUNDINGS. GROUND COVER SHALL NOT REDUCE TRENCH VISIBILITY.
3. TRENCHES CONSTRUCTED ON STANDARD TRAINING RANGES SHALL NOT BE USED FOR LIVE GRENADE TRAINING.
4. WALLS SHALL BE CONSTRUCTED OF TREATED TIMBERS. FILTER FABRIC SHALL BE INSTALLED BEHIND ALL WOOD WALLS BELOW GRADE. FABRIC SHALL EXTEND THE FULL HEIGHT OF THE WALL.
5. ALL DIMENSIONS ARE mm UNLESS OTHERWISE INDICATED.
6. SEE SHEET S-15 FOR STRUCTURAL DETAILS.

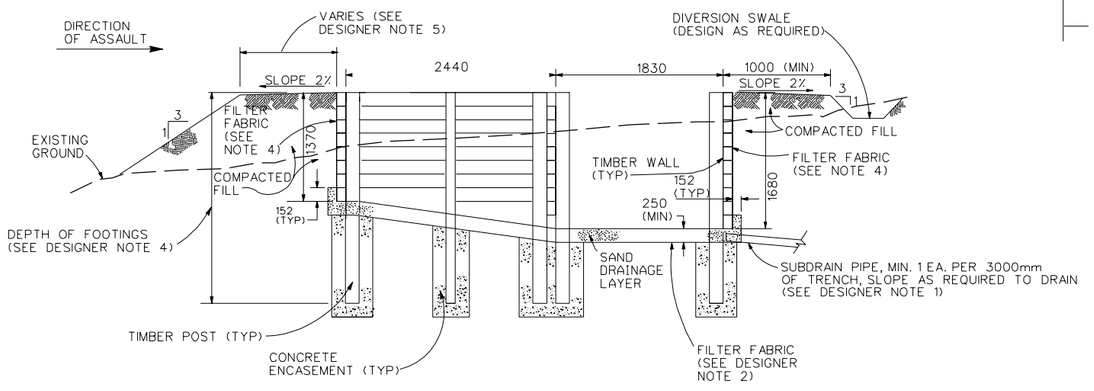
NOTES TO DESIGNER:

1. A SUBDRAIN SYSTEM SHALL BE PROVIDED TO ENSURE ADEQUATE DRAINAGE OF TRENCH.
2. THE NEED FOR FILTER FABRIC SHOULD BE EVALUATED AS PART OF THE SITE ADAPTION PROCESS. A FILTER LAYER MAY OR MAY NOT BE REQUIRED DEPENDING UPON THE SOIL TYPE AT A PARTICULAR SITE.
3. THIS GENERIC DESIGN FOR THE TRENCH MUST BE SITE ADAPTED TO SPECIFIC SITE CONDITIONS DETERMINED BY A SUBSURFACE INVESTIGATION AND A TOPOGRAPHIC SURVEY.
4. DEPTH OF FOOTING WILL VARY DEPENDING UPON SUBSURFACE INVESTIGATION AND COMPACTION REQUIREMENTS DURING CONSTRUCTION.
5. REFER TO THE BERM THICKNESS FIGURES LOCATED IN THE DESIGN MANUAL TO DETERMINE THE REQUIRED BERM THICKNESS.
6. BERM SLOPES SHOWN AS 3:1 ARE MAXIMUM. FLATTER SLOPES MAY BE REQUIRED BY SITE SPECIFIC GEOTECHNICAL REPORT.
7. ACTUAL LAYOUT MAY VARY PER TRAINING REQUIREMENT AND SITE CONDITIONS.



PLAN
NOT TO SCALE

TRENCH



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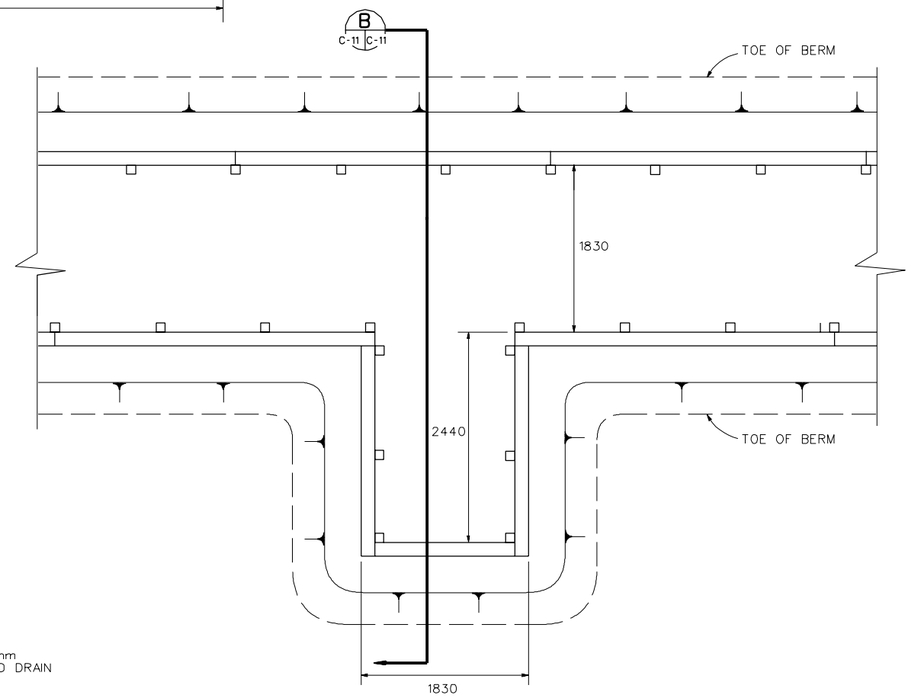
C-11 C-11



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RANGE AND TRAINING LAND PROGRAM
STANDARD DESIGN MANUAL

TRENCH

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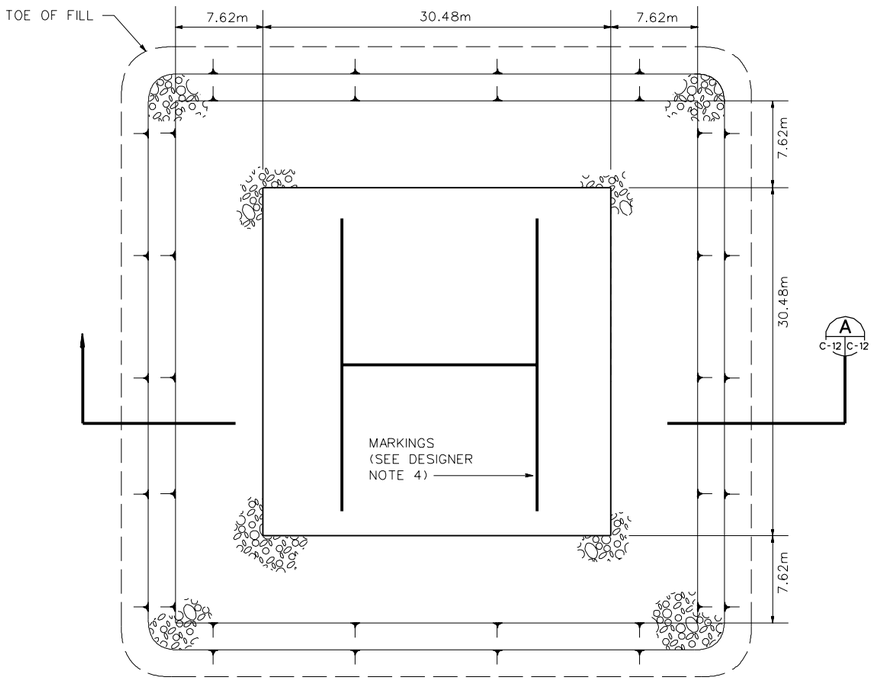


HELIPAD PLAN VIEW

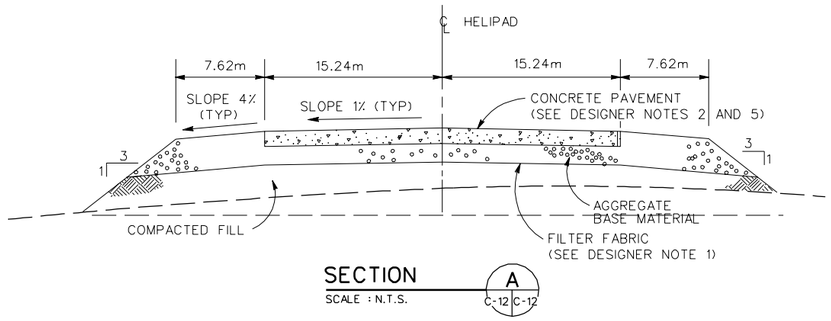
SCALE: N.T.S.

NOTES TO DESIGNER:

1. THE NEED FOR FILTER FABRIC SHOULD BE EVALUATED AS PART OF THE SITE-ADAPTION PROCESS. A FILTER LAYER MAY OR MAY NOT BE REQUIRED DEPENDING UPON THE SOIL TYPE AT A PARTICULAR SITE.
2. SEE TM 5-825-3 FOR SPACING REQUIREMENTS AND DETAILS FOR CONSTRUCTION & CONTRACTION JOINTS.
3. A HELIPAD IS NOT TO BE USED WITHIN THE RANGE LIMITS. ALL DOWNRANGE LANDING ZONES/PICKUP ZONES SHALL BE CLEARED AREAS IN ORDER TO MAINTAIN REALISTIC TRAINING. HELIPAD IS TO BE CONSTRUCTED BEHIND THE ASSEMBLY AREA ONLY.
4. USE STANDARD HELIPAD MARKINGS (SEE TM 5-823-4).
5. SEE TM 5-803-4 AND TM 5-825-3 FOR DESIGN OF RIGID PAVEMENT FOR HELIPAD.
6. FILL SLOPES SHOWN AS 3:1 ARE MAXIMUM. FLATTER SLOPES MAY BE REQUIRED BY SITE SPECIFIC GEOTECHNICAL REPORT.

GENERAL NOTES:

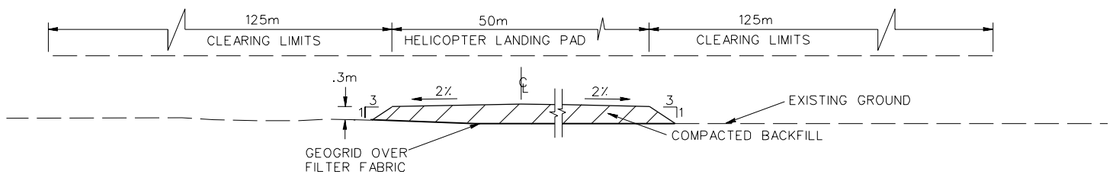
1. CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 28 MPa IN 28 DAYS.
2. ALL REINFORCING STEEL SHALL BE PER ASTM A615, GRADE 60.
3. AREAS DISTURBED BY CONSTRUCTION ACTIVITIES SHALL BE REVEGETATED OR RESURFACED CONSISTENT WITH THE NATURAL SURROUNDINGS INCLUDING THE HELICOPTER LANDING PAD.
4. CLEARING TO INCLUDE STRIPPING ALL VEGETATION ABOVE EXISTING GROUND INCLUDING GRASS, WEEDS, BRUSH, ETC.



SECTION A

SCALE : N.T.S.

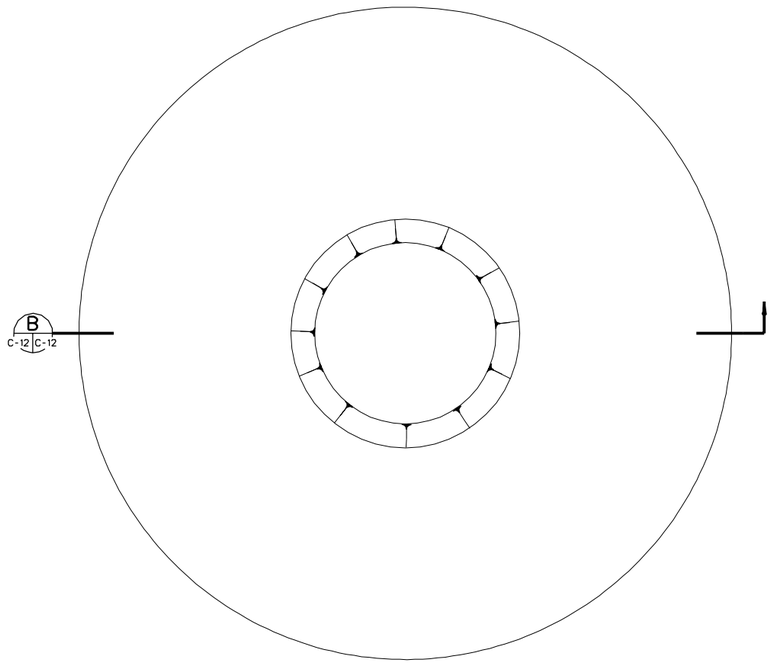
C-12 C-12



SECTION B

SCALE : N.T.S.

C-12 C-12



HELICOPTER LANDING ZONE PLAN (TACTICAL/TRAINING)

SCALE: N.T.S.

US Army Corps of Engineers

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RANGE AND TRAINING LAND PROGRAM
STANDARD DESIGN MANUAL

HELIPAD & HELICOPTER LANDING ZONE

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